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**NOTULAE MALACOLOGICAE, XLIII
XEROMUNDA DI MARIA DI MONTEROSATO IN ITALY (PULMONATA:
HYGROMIIDAE)****

KEY WORDS: *Xeromunda*, Hygromiidae, southern Italy, systematics, biogeography.

Abstract

The presence of a species of the genus *Xeromunda* in the Italian Peninsula is confirmed. The species limited to a restricted area near Taranto (Puglia), has been anatomically revised and proved to be more closely related to North African *X. cf. durieui* (L. PFEIFFER) and not to the Greek *X. candiota* (MOUSSON).

Riassunto

La presenza in Italia di una specie del genere *Xeromunda* viene confermata. Questa specie, vivente in una ristretta area presso Taranto, è stata studiata anatomicamente e confrontata con individui di popolazioni riferite sia a *X. d. durieui* (L. PFEIFFER), sia a *X. durieui candiota* (MOUSSON) presenti in altre aree del Mediterraneo. L'indagine ha consentito di evidenziare come *Xeromunda* sia anatomicamente ben diverso da tutti gli altri generi degli Hygromiinae sensu SCHILEYKO dettagliatamente descritti fino ad oggi. *Xeromunda* ha, infatti, un solo stiloforo che non si apre direttamente nella vagina, ma in una porzione differenziata del complesso del sacco del dardo, qui definita «porzione basale». Una parte dello stiloforo, il lato della «porzione basale» rivolto verso la vagina, e un breve tratto della vagina distale sono avvolti da una guaina. Quest'ultima delimita una cavità che comunica con la cavità della «porzione basale» attraverso una piccola finestra. Il confronto tra le varie popolazioni esaminate ha permesso di individuare l'esistenza di due gruppi differenziati. Il primo comprendente le popolazioni di Taranto, Tunisia, Libia e Cipro è caratterizzato da un complesso del sacco del dardo formato da un piccolo stiloforo e da una grande «porzione basale». All'interno della «porzione basale», sul lato rivolto verso la vagina, si sviluppano due lunghe pliche longitudinali. Il secondo gruppo comprendente le popolazioni viventi a Creta, nelle Cicladi e in Grecia è caratterizzato da un complesso del sacco del dardo formato da uno stiloforo più sviluppato rispetto alla «porzione basale». All'interno della porzione basale, sul lato rivolto verso la vagina, si sviluppano due pliche longitudinali brevi ed esili. Nell'attesa di poter estendere lo studio ad altre popolazioni e in particolare a quelle topotipiche di *X. durieui*, riteniamo opportuno definire *X. candiota* (MOUSSON) le popolazioni anatomicamente corrispondenti a quelle topotipiche di Creta, e come *X. cf. durieui* (L. PFEIFFER) le popolazioni di Taranto e Cipro anatomicamente corrispondenti a quelle delle Tunisia e della Libia.

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Nell'ultima parte della presente nota si analizza il caso di *Helix turbinata* DE CRISTOFORI & JAN, la specie designata da KOBELT come specie tipo del genere *Xeromunda*. Dopo aver dimostrato (cf. MANGANELLI & GIUSTI, 1988 e GIUSTI & MANGANELLI, 1989) che *H. turbinata* sensu KOBELT e DI MARIA di MONTEROSATO è, in realtà, una specie greca (cioè *H. candiota* MOUSSON) rimaneva da chiarire l'identità della specie descritta da DE CRISTOFORI & JAN per la Sicilia. Attraverso una attenta analisi della letteratura e di materiali di vecchie collezioni viene ipotizzato che *H. turbinata* DE CRISTOFORI & JAN corrispondesse ad una *Cernuella*. Nell'impossibilità oggettiva di individuare la specie gli autori ritengono necessario proporre alla Commissione Internazionale di Nomenclatura Zoologica di collocare *H. turbinata* DE CRISTOFORI & JAN nell'Official Index of Rejected and Invalid Specific Names in Zoology.

Introduction

Recent attempts to solve the problem of the real identity of the genus *Xeromunda* DI MARIA di MONTEROSATO, 1892 (see MANGANELLI & GIUSTI, 1988) and its real type species (see GIUSTI & MANGANELLI, 1989) led us to check the presence in Italy of species of this group.

In discussing the subspecific differentiation of "*Cernuella* (s. str.)" *durieui* (L. PFEIFFER, 1848; Locus typicus; El Kala, Algeria) BRANDT (1959: 85) wrote that one of the subspecies, "*C.*" *durieui candiota*, could be found in Sicily and Puglia (Southern Italy) associated with «typical "*C.*" *turbinata* JAN» (problems related to which will be discussed below).

PAGET (1962: 182-183) and FORCART (1965: 130) mentioned finding of "*C.* (s. str.)" *durieui candiota* on the sea-shores in certain localities near Taranto (La Praia, Chiatona and Lido Bruno).

Aware of the extreme difficulty of identifying the generic status of a species of the "*Helicellinae*" by conchological examination alone, we started with a collection program near Taranto in search of living specimens whose shell characters might correspond to those of the supposed "*C.* (s. str.)" *durieui candiota* of BRANDT, PAGET and FORCART.

Recently Dr. G. ARALLA finally succeeded in this task. Anatomical research confirmed the presence of a *Xeromunda* species in southern Italy. This species differed from *X. candiota* of Crete, resembling *X. cf. durieui* of North Africa.

Xeromunda cf. durieui (L. PFEIFFER)

[Fig. 1, 3E; Pl. 1, figs. A-D; Pl. 3, figs. A-D]

Helix Durieui L. PFEIFFER (1848). Monographia Heliceorum viventium, 1: 441. Locus typicus: «Habitat prope Lacalle Algeria», i.e. El Kala, Algeria.

Cernuella (*C.*) *durieui candiota*, BRANDT (1959), *Arch. Molluskenk.*, **88**: 85-86 [non MOUSSON, 1854].

Cernuella (*C.*) *durieui candiota*, PAGET (1962), *Mem. Soc. Biogeogr. adriat.*, **4**: 182-184, figs. 1-2. [non MOUSSON, 1854].

Cernuella (*C.*) *durieui candiota*, FORCART (1965), *Verh. naturforsch. Ges. Basel*, **76**: 130 [non MOUSSON, 1854].

Helicella (*Xeromunda*) *durieui candiota*, ALZONA (1971). *Atti Soc. ital. Sci. nat. Mus. civ. Stor. nat. Milano*, **111**: 165 [non MOUSSON, 1854].

Description

Shell (Pl. 1, figs. A-D) small to medium in size, globose-conical, with transverse growth lines, opaque, white or yellow-brown with sparse paler, vertical flecking, usually with a paler spiral band at the periphery. The spire is conical and has $4\frac{1}{2}$ - 5 regularly increasing whorls, the last of which is particularly developed. The whorls are convex and separated by moderately deep sutures. The umbilicus is open, very small and almost completely covered by the columellar margin of the peristome. The opening is oval or roundish, moderately oblique; the peristome is not thickened, reflexed only slightly in correspondence with the columellar margin, yellow-brown or red-brown in colour, with a trace of an internal rib.

Dimensions: shell max. diam. 9 - 11 mm; shell height 8.5 - 10 mm.

The genital duct (Figs. 1A-F, 3E) has a multilobate gonad from which the first hermaphrodite duct arises. This duct is circumvolute and in adult specimens filled with spermatozoa except for the extreme tract before it enters the talon. The talon (i.e. the fertilization chamber + seminal receptacle complex) lies on the inner side of a large albumen gland near the beginning of the second hermaphrodite duct (or ovispermiduct) which consists of a prostatic and a uterine portion. A long slender vas deferens arises from the prostatic portion and ends in the base of the penial complex. The latter consists of a short flagellum (1.8 - 2.2 mm long; in 5 sps.), an epiphallus (i.e. the part extending from where the vas deferens ends to the point of attachment of the penial retractor) and a penis (i.e. the part extending from the point of attachment of the penial retractor to the genital atrium). Thin connective bundles extend from the genital atrium walls to the epiphallus at various levels. The penial retractor is long and slender. The penis, about half the length of the epiphallus, is wider in calibre than the epiphallus and contains a conical papilla (i.e. a glans) inside its distal half. The penial papilla has an apical opening and shows a structure similar to that which is considered typical of the Euomphaliinae by SCHILEYKO (1978). Transverse sections of the penial papilla show a central canal, continuous with the proximal penis, separated by a very thin endopapillar space from the external sheath which is continuous with the penial walls. The uterine portion of the ovispermiduct continues anteriorly in a short uterine canal (i.e. free oviduct). A duct, initially flared, arises from its walls and leads to the bursa copulatrix (i.e. gametolytic gland) which is oval and variable in width. The neck of the bursa copulatrix is fastened to the ovispermiduct by a thick ring of muscular-connective bundles. From the very beginning of the proximal vagina walls two tufts of branched digitiform glands arise. The vagina is fairly long and wide and consists of a proximal portion (from the digitiform glands to behind the dart-sac complex) and a distal portion to which the dart-sac complex is annexed and which ends in the genital atrium. The dart-sac complex is formed by an apical stylophore and a basal portion. The stylophore, containing a dart, seems a short and small appendix of the larger basal portion. A thin walled sheath wraps part of the stylophore, the side of the basal portion facing the vagina and a small portion of the distal vagina. The sheath defines a cavity which communicates through a small window with the basal portion. The window is

situated level with the stylophore opening into the basal portion. The cavity of the basal portion has two longitudinal pleats (sometimes apparently double) which arise from the external side of the stylophore opening and end near the vaginal opening. Other transverse pleats cover the rest of the basal portion walls. The stylophore is very short, has fairly thick muscular walls and contains the basal portion of the dart. The dart tip protrudes into the basal portion. The dart is gently curved and has an arrow head tip, rhombic in transverse section, but with only two opposite wings. The base of the dart is circular in section.

Other anatomical peculiarities: the penial nerve arises from the right pedal ganglion; the right ommatophore retractor is independent of penis and vagina; the mantle collar morphology corresponds to that observed in other Hygromiidae.

The radula (Pl. 3, figs. A-D) consists of many rows of teeth according to the formula $28-32 + C + 28-32$. The central tooth has a wide basal plate with pointed upper vertices. The tooth body has an apex provided with a long robust mesocone and two small pointed ectocones. The first lateral teeth have a robust basal plate with only the external upper vertex pointed. The apex of the lateral teeth is formed by a wide strong mesocone and a short pointed ectocone. The mesocone has a slightly concave inner side sometimes with a slightly protuberance, precursor of the second point which the mesocone apex develops in the latero-marginal teeth. The side of the mesocone from the base to the protuberance is frequently milled. Proceeding outwards, the successive lateral teeth gradually become smaller with more slender pointed cusps and a less evident basal plate. At about 17th-20th tooth the mesocone begins to have an evident, sometimes double, point on its inner side. The extreme marginal teeth have a mesocone with a distinctly doubled apex and more slender pointed ectocones, often with 2-3 points.

Materials examined

La Praia (Taranto, Italy), G. ARALLA leg. 5.1.1988, numerous specimens.

Fig. 1. - *Xeromunda cf. durieui* (L. PFEIFFER). Genital duct and its portions in specimens collected at Chiatona (Taranto, Italy). A: the genital duct (gonad excluded). B: the dart. CD: the penial papilla and two of its sections. E: the scheme of the dart-sac complex. F: the basal portion of the dart-sac complex and the genital atrium have been opened to show the inner structure.

Explanations of the symbols used in Figs. 1-5: **AG** albumen gland, **BC** bursa copulatrix (gametolytic gland), **BP** basal portion of the dart-sac complex, **CBC** duct of the bursa copulatrix, **D** dart, **DFG** digitiform glands, **DSC** dart-sac complex, **E** epiphallus, **F** flagellum, **FO** free oviduct, **GA** genital atrium, **HD** hermaphrodite duct, **LP** longitudinal pleats of the basal portion of the dart-sac complex, **P** penis, **PO** prostatic portion of the ovispermiduct, **PP** penial papilla (glans), **PR** penial retractor muscle, **SC** cavity of the dart-sac complex sheath, **SCO** opening of the cavity of the dart-sac complex sheath into the basal portion of the dart-sac complex, **ST** stylophore, **STO** stylophore opening, **T**, talon, **UO** uterine portion of the ovispermiduct, **V** vagina, **VD** vas deferens.

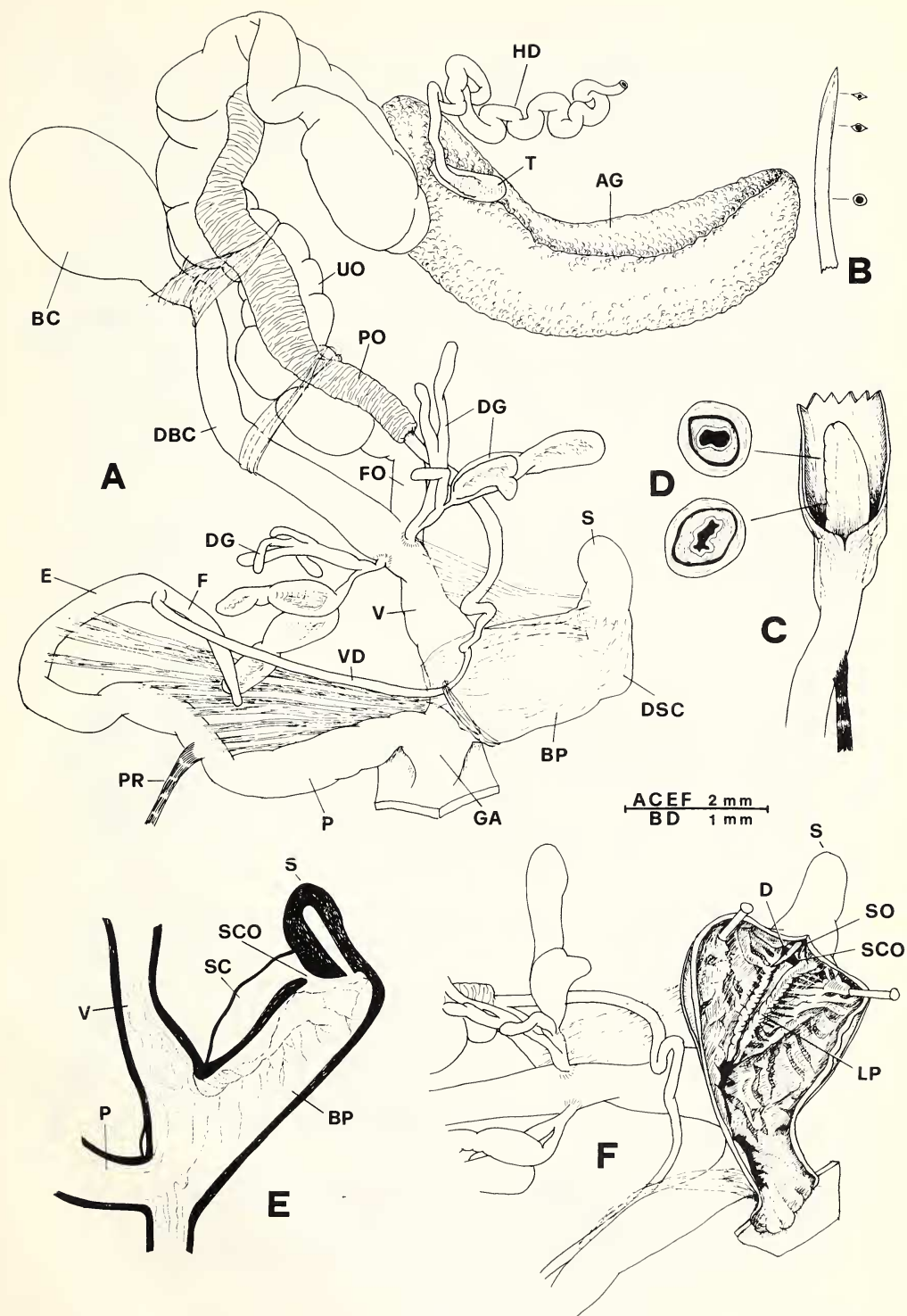


Fig. 1

Comments

To provide foundation for any conclusion about the name and affinities of the Taranto specimens we extended our analysis to various materials (topotypical and otherwise) of *H. candiota* MOUSSON (Locus typicus: Crete Island), usually known in the recent literature as an eastern Mediterranean subspecies of *X. durieui*, and to materials, unfortunately not topotypical of *X. durieui*.

The stylophore of the *Xeromunda* from Libya and Tunisia⁽¹⁾ (Fig. 2) is small, about half the length of the basal portion of the dart-sac complex. The external sheath which wraps part of the stylophore and the side of the basal portion facing the vagina, is extended to wrap a very short tract of the distal vagina; internally, on the side of the basal portion facing the vagina there are two (sometimes apparently doubled) long longitudinal pleats; the penial flagellum is short, but never shorter than 1.8 mm. The radula of the Libyan specimens (Pl. 3, figs. E-H) appears to correspond almost completely to that of the Taranto specimens in number (29-30 + C + 29-30) and shape of teeth, however the inner side of the mesocone of the lateral teeth is more evidently milled.

The *Xeromunda* from Crete, Syros Island and other islands of Cyclades and Greece⁽²⁾ (Fig. 3A-D, 4A-F) differed in the following characters: the stylophore is wide and long, almost twice the length of the very reduced basal portion of the dart-sac complex; the external sheath which wraps part of

- (1) Materials examined: 1) 6 sps., Al Albyar, (about 50 km ENE of Benghazi; Cyrenaika, Libya), C.O. VAN REGTEREN ALTENA leg. 15.III.59, RMNH. 2) 1 sp., south of Mahdia (Tunisia), H.W. WALDEN leg. 3.XII.74. GNM, Gen. Kat. no. 74-13898.

Explanations of the abbreviations used in the materials examined and in the explanations of the Pls. 1-2: **FCMC**, Fondazione culturale Mandralisca, Cefalù, Italy; **GNM**: Göteborgs Naturhistoriska Museum, Sweden; **MRSNT**: Museo Regionale di Scienze Naturali, Torino, Italy; **NMW**: Naturhistorisches Museum Wien, Austria; **MZUF**: Museo di Zoologia dell'Università di Firenze, Italy; **RMNH**: Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands.

- (2) Materials examined from Crete Island: 1) 4 sps., 1 km WSW of Amnissos, H.W. WALDEN leg. 18.IV.75. GNM, Gen. Kat. no. 75-13974. 2) 1 sp., Sziget, Chania Region, L.J.M. BUTOT & P. SUBAI leg. 8.II.81, SUBAI Coll. 3) 3 sps., Nomos Rethimnis, W.H. NEUTEBOOM leg. 9.X.85, NEUTEBOOM Coll.

Other material examined: 1) 3 sps., Island of Anaphi (Cyclades Is.), M. MYLONAS leg. 3.XI.79. 2) 4 sps., Island of Antiparos (Cyclades Is.), M. MYLONAS leg. 17.XII.79. 3) 2 sps., POLI, 3 km S of Fri, Kasos Island, A. RIEDEL leg. 29.IV.80. 4) 9 sps., Island of Serifos (Cyclades Is.), M. MYLONAS leg. 12.XII.78. 5) 5 sps., Island of Sikinos (Cyclades Is.), M. MYLONAS leg. 22.I.80. 6) 8 sps., Island of Siphnos (Cyclades Is.), M. MYLONAS leg. 4.XII.78. 7) 7 sps., Island of Syros (Cyclades Is.), M. MYLONAS leg. 19.X.78. 8) 6 sps., Island of Tinos (Cyclades Is.), M. MYLONAS leg. 11.I.79. 9) 6 sps., Monemvasia, Peloponnese Peninsula, B. HAUSDORF leg. 30.IX.86.

Fig. 2. - *Xeromunda* cf. *durieui* (L. PFEIFFER). Genital duct in specimens collected near Mahdia (Tunisia) (A-E) and at Al Albyar (Cyrenaika, Libya) (F-L). A,F: the genital duct. E: the scheme of the dart-sac complex. D,L: the basal portion of the dart-sac complex and the atrium have been opened to show the inner structure. C, G-H: the penial papilla and some of its sections. B: the dart tip. Symbols as in Fig. 1.

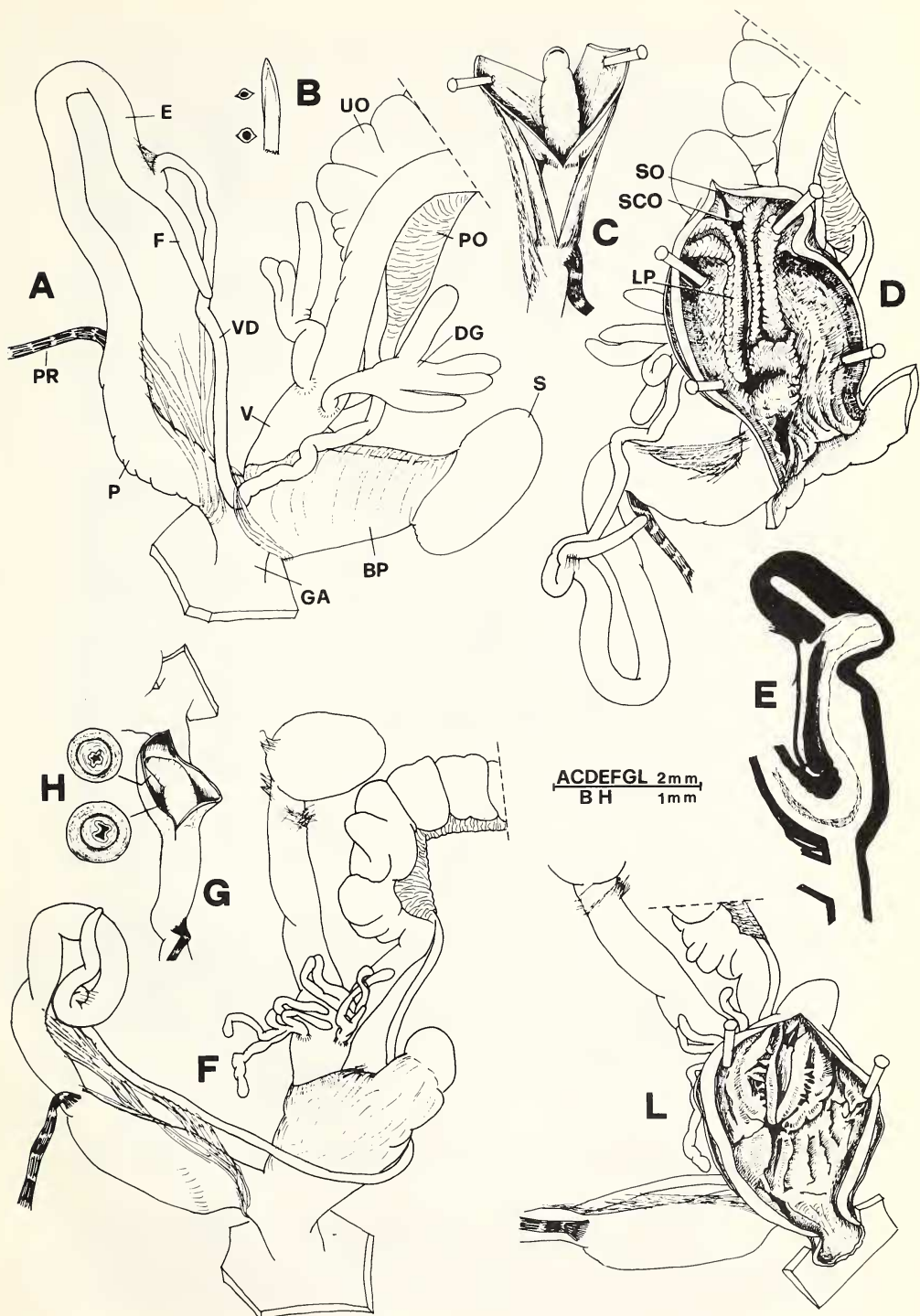


Fig. 2

the stylophore and the side of the basal portion facing the vagina, also extends to wrap a long tract of the distal vagina; two short longitudinal pleats are present although not clearly visible on the internal walls of the side of the basal portion facing the vagina; the penial flagellum is usually very short (6 sps. measured 0.8-1.2 mm; in an exceptional specimen from Siphnos I. (Cyclades) it was 1.9 mm). The radula (Pl. 4, figs. A-G) is very similar to that of the Taranto specimens in number (25-29 + C + 25-29) and shape of teeth however the inner side of the mesocone of the lateral teeth is not or only very slightly milled.

The presumed *X. candiota* from Cyprus⁽³⁾ (Fig. 5 B-C), studied by HESSE (1934: 8, Pl. 1, figs. 9a-d), appeared more similar to those from North Africa and Taranto because of a very short stylophore, half the length of the basal portion of the dart-sac complex. Moreover the sheath which wraps part of the stylophore and the side of the basal portion facing the vagina extends to wrap a very short tract of the distal vagina. Internally, on the side of the basal portion facing the vagina, there are two long longitudinal pleats, however the penial flagellum did not exceed 1.4 mm.

On the basis of the above descriptions it is clear that the Taranto specimens correspond perfectly to those from Libya and Tunisia, and differ in a series of characters from those of Greece, Crete and other Greek islands. It thus seems possible to confirm BRANDT'S (in HAUSDORF, 1988) hypothesis of a differentiation at the species level of *X. candiota* from the north African populations supposedly corresponding to *H. durieui*.

A surprising finding which suggests prudence in drawing conclusions is that Cyprus specimens appear to differ from those of Greece, Crete and the other Greek islands and to resemble those of Taranto, Libya and Tunisia. The anatomical study of topotypical populations of *Helix durieui* from El Kala (Algeria) and other Greek, Syrian, Lebanese and Egyptian populations is required before a definitive conclusion can be reached. For the present we will refer to the populations anatomically corresponding to those living on Crete as *X. candiota* and the Cyprus and Taranto populations as *X. cf. durieui*. The latter appear to correspond to those of Libya and Tunisia, usually assigned to *H. durieui*.

The most important result of the present research is the clearer definition of *Xeromunda*. This genus is easily distinguished from *Cernuella* and all the other Hygromiidae with a dart-sac complex formed by two fused stylophores on the same side of the vagina. Apart from minor differences such as penial papilla structure, its dart-sac complex is of so different a structure that any possibility of a recent relationship can be excluded. It

(3) Materials examined from Cyprus Island: Akrotiri-Bucht, MAYROMOUS TAKIS leg. 1933, HAAS Coll., SMF 6321, 8 sps.

Fig. 3. - Genital duct in specimens of *Xeromunda candiota* (MOUSSON) from Amnisos (Crete I.) (A-D) and *X. cf. durieui* (L. PFEIFFER) (E) in a specimen from Chiatona (Taranto, Italy). A-B: the penial papilla and two sections thereof. C,E: the genital duct. D: the basal portion of the dart-sac complex has been opened to show the inner structure. Symbols as in Fig. 1.

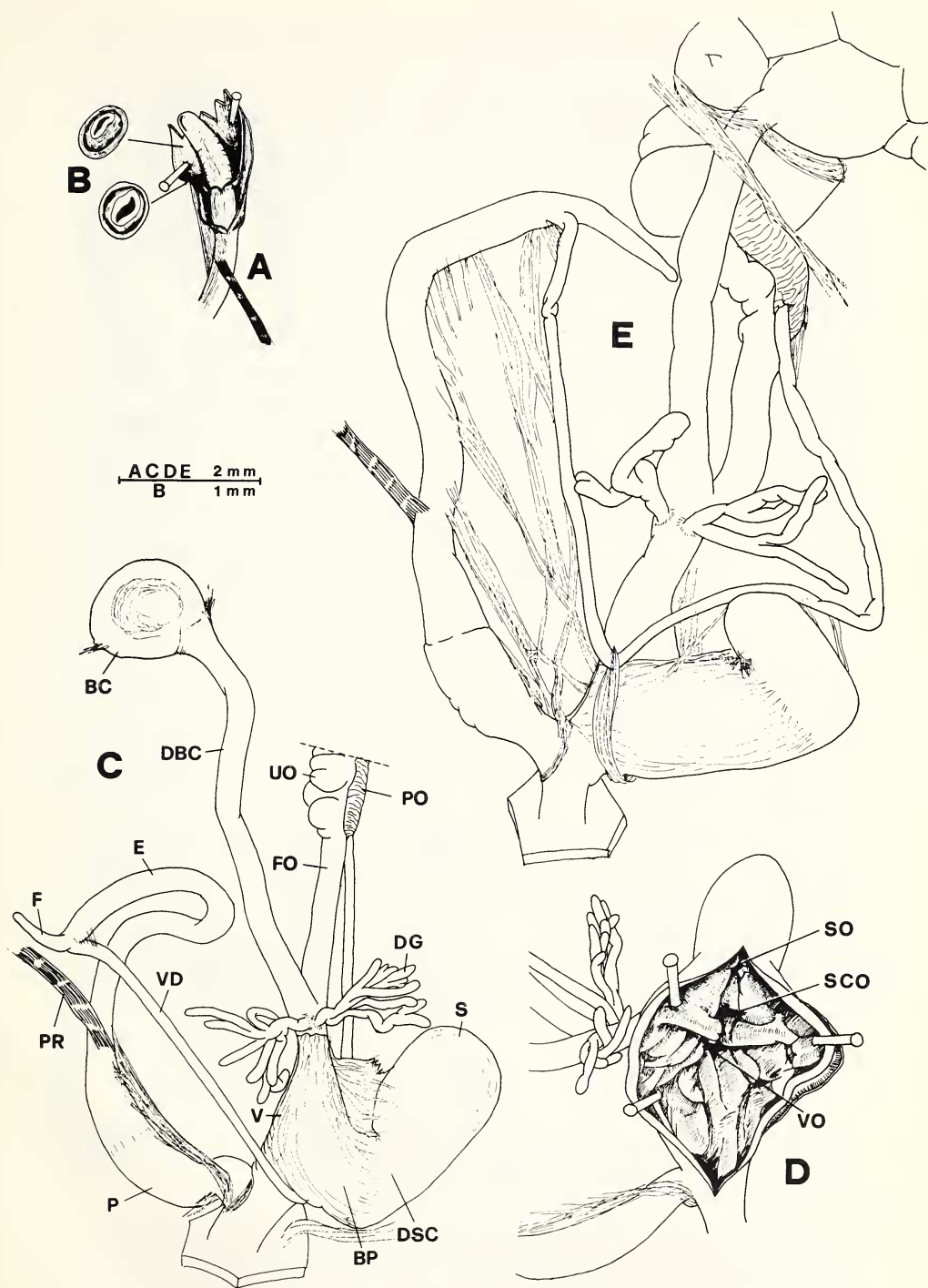


Fig. 3

has only one stylophore which does not enter the vagina directly but communicates with the distal vagina via a differentiated portion referred to above as the «basal portion of the dart-sac complex». Moreover the peculiar thin sheath which wraps part of the stylophore, the side of the basal portion facing the vagina and part of distal vagina (thus defining a cavity which communicates with the basal portion through a window situated level with the opening of the stylophore), is completely unlike the arrangement in other Hygromiidae (such as *Candidula*) in which there is only one stylophore and the right ommatophore retractor is independent of penis and vagina. As a consequence, any relationship with *Candidula* can be excluded; the two genera are vaguely similar only in the external shape of the dart-sac complex.

We found indications of a possible relationship between *Xeromunda* and a species usually included in the genus *Xerothracia* SCHUTT, 1962)⁽⁴⁾. *X. pappi* from Greece has two opposedly placed structures in the vagina, each one corresponding to the single dart-sac complex of *Xeromunda*. Moreover *X. pappi* has a sheath which wraps the vagina and the side of the two dart-sac complexes facing the vagina, thus defining a cavity which communicates with the basal portion of each dart-sac complex through a window situated level with the stylophore opening. Although the penial papilla structures are markedly different (as is the shell shape), it seems likely that *Xeromunda*, in the distant past, diverged from a form similar to *Xerothracia* by loss of one of the dart-sac complexes. This hypothesis agrees very well with some of the SCHILEYKO (1978) assumptions on the evolution of many Hygromiidae genera by a progressive reduction in the number of stylophores. The hypothesis nevertheless appears to negate the validity of SCHILEYKO's (1978) separation of the Trichiinae from the Hygromiinae. If the above phylogenetical reconstruction is true, *X. candiota* can be considered more primitive than *X. durieui*. The latter is characterized by a remarkable reduction of the stylophore, which seems to be a small apical appendix of the dart-sac complex.

X. cf. durieui may possibly have originated in the eastern Mediterranean and have later dispersed towards North Africa (presumed *Xeromunda* have been found on the Syrian and Egyptian coasts see GERMAIN, 1921; PALLARY, 1909; SACCHI, 1955a).

The presence of *X. cf. durieui* in southern Italy could be explained by passive (anthropochorous) dispersal phenomenon (SACCHI, 1955a), or past faunistic migration from North Africa and Italy, via Sicily.

(4) Research on the real value of *Xerothracia*, its eventual synonymy with *Xerolenta* and on the relations between *Xerolenta* and *Helicella* are under way in our laboratory. Some news about have been anticipated by HAUSDORF (1988).

Fig. 4. - *Xeromunda candiota* MOUSSON. Genital duct in specimens from Syros Island. A: the scheme of the dart-sac complex. B: the dart. C: the genital duct. D: the basal portion of the dart-sac complex and the genital atrium have been opened to show the inner structure. E-F: the penial papilla and two of its sections. Symbols as in Fig. 1.

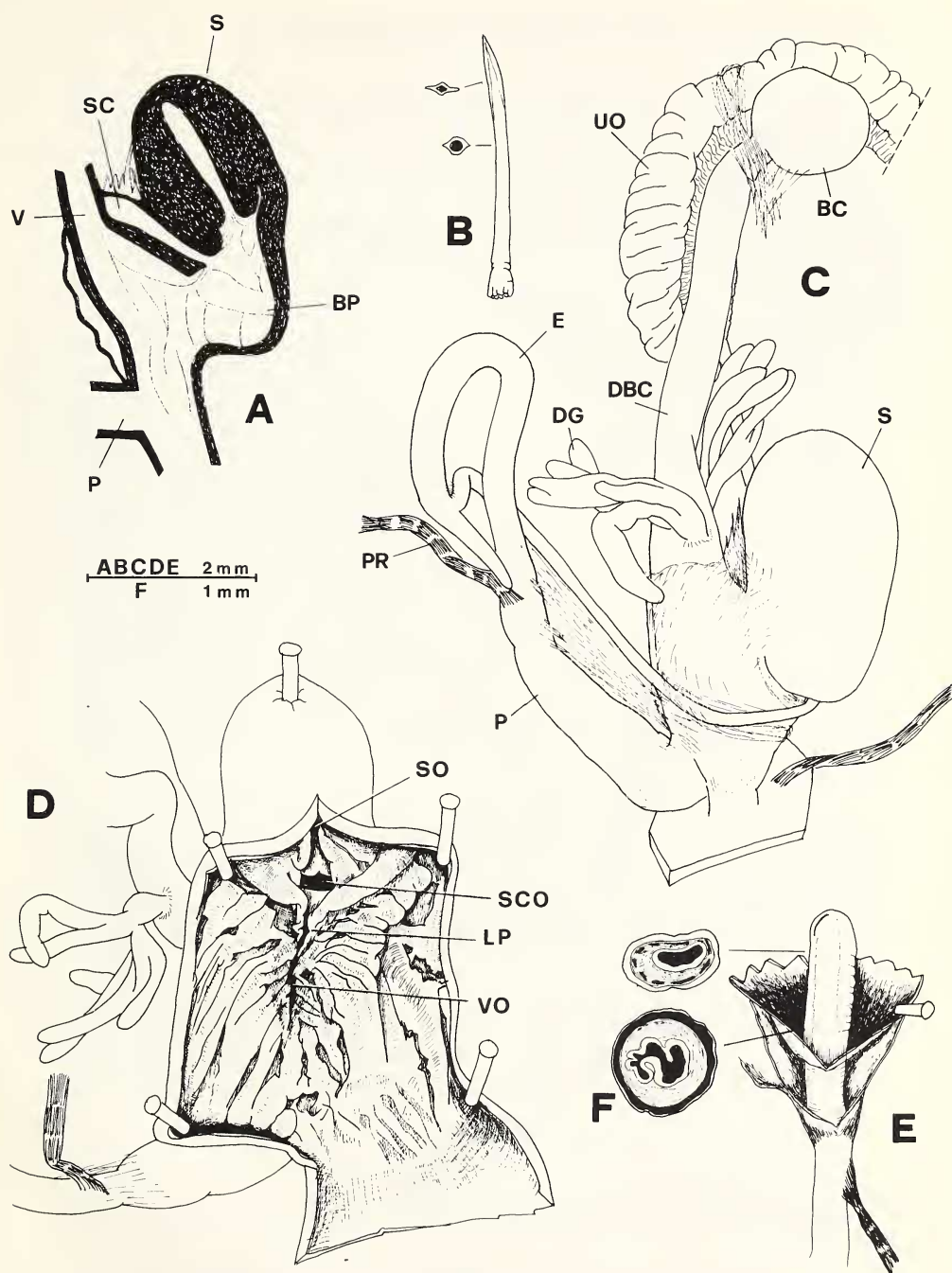


Fig. 4

The problem of *Helix turbinata* de Cristofori & Jan

DE CRISTOFORI & JAN (1832, Conchylia, pag. 4) listed *Helix turbinata* as a species of Sicily and soon after (1832; Mantissa, pag. 2) described it as follows: «*Helix*, testa conico-globosa, subperforata, albida, alt. 5''' (about 10mm) lat. 6''' (about 12mm), apertura lunari-rotundata diam. 3''' (about 6mm), peristomate simplici, marginato».

Although this name is a primary homonym of *Helix turbinata* GMELIN (1791: 3668) and *Helix turbinata* DESHAYES (1831: 265), it was utilized by L. PFEIFFER (1846: 254-255) for a species he described as living: «nach Jan auf Sizilien. Ich erhielt sie durch Hrn. Forbes von der griechischen Insel Syra; nach Frivaldsky auch auf Creta». L. PFEIFFER wrote again (1848: 155) that *H. turbinata* lived both in Sicily and the Greek islands of Syra and Crete.

MOUSSON (1854) was the first to state that the Sicilian *H. turbinata* should be distinguished from the Greek populations. For the latter he proposed the name «*Helix candiota* Friss.» (misspint for Frivaldsky). This rectification was completely ignored by many authors who continued to use the name *H. turbinata* for materials from the Greek islands (KOBELT, 1877; WESTERLUND & BLANC, 1879; DI MARIA DI MONTEROSATO, 1892).

KOBELT (1877) pointed out that two different species had been confused under the name *H. turbinata* sensu L. PFEIFFER but wrongly resolved the problem, leaving room for further confusion, when he wrote that because the name *H. turbinata* had been very widely adopted for Greek materials it should continue to be used for the Greek species. As for the original *H. turbinata* from Sicily, KOBELT wrote «... which having Sicily as type locality is certainly that which follows in this catalogue», thus suggesting that it should be called by the name of the eventual junior synonym: *Helix aradasi* PIRAJNO DI MANDRALISCA (1842).

Despite these contradictions⁽⁵⁾, KOBELT's proposal gained a degree of success, and was at least partially adopted by more recent authors, some of whom accepted *H. aradasi* as a junior synonym of *H. turbinata*. In so doing, the *H. aradasi* type locality (the banks of the swamps near the Lighthouse of Messina) had since then been adopted by many as a sort of locus typicus restrictus for *H. turbinata* (BENOIT, 1882; POLLONERA, 1892; SACCHI, 1955b; ALZONA, 1971).

The eventual synonymy of *H. turbinata* and *H. aradasi* was considered by PAULUCCI (1879), WESTERLUND (1889) and more recently by SACCHI (1955b) but doubted or rejected by other authors (DI MARIA DI MONTEROSATO, 1892; POLLONERA, 1892; ALZONA, 1971). An interesting posi-

(5) This proposal makes sense only if KOBELT was aware of the fact that *H. turbinata* DE CRISTOFORI & JAN was a junior homonym.

Fig. 5. - Genital duct in specimens of *Xeromunda* cf. *durieui* (L. PFEIFFER) (B-C) from Akrotiri Bucht (Cyprus I.) and in specimens of small-sized *Cernuella* from the locus typicus of *Helix aradasi*: Lighthouse of Messina (Sicily, Italy) A-B: the genital duct. C: the basal portion of the dart-sac complex has been opened to show the inner structure. Symbols as in Fig. 1.

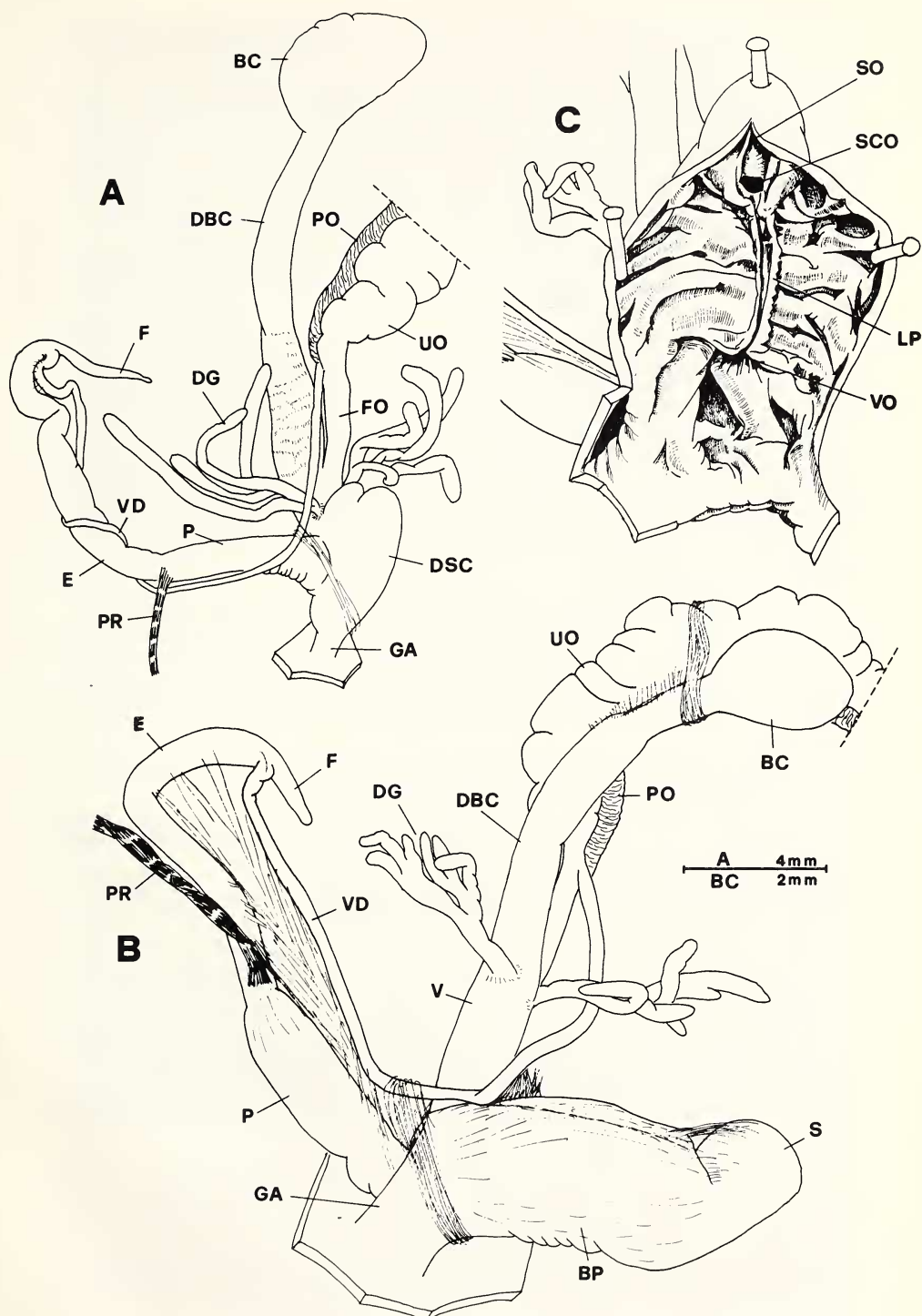


Fig. 5

tion was taken by POLLONERA (1892). He regarded *H. aradasi* (included in the genus *Xerophila*) as a form or a simple variety of *X. subprofuga* STABILE (i.e. a taxon of the small-sized *Cernuella* group of forms sensu GIUSTI, 1976, 1980 and MANGANELLI & GIUSTI, 1988), but he claimed that it was also similar to «*X. turbinata* Jan» which was treated by him as a species different from the Greek populations about which, he wrote: «KOBELT, by repeating the mistake of many of his predecessors, has given it the name *turbinata*».

Fortunately typical materials of *H. aradasi* (Pl. 2, figs. G-H) have recently discovered and a lectotype selected (see GIANNUZZI SAVELLI *et al.*, 1986)⁽⁶⁾. This has allowed us to confirm POLLONERA's opinion and to recognize it as one of the many forms with elevated spire belonging to the small-sized *Cernuella*.

We have moreover had the opportunity to locate the supposed *H. turbinata* of POLLONERA (1892) (Pl. 2, fig. K) in the POLLONERA Collection in the Museo Regionale di Scienze Naturali di Torino (Italy). Though apparently similar in shell shape to certain *X. cf. durieui* from North Africa (cf. Pl. 1, fig. F), these shells, which are identical to the typical materials of *H. aradasi*, could also be hypothesized to belong to the same small-sized *Cernuella* group of forms. Anatomical research on specimens conchologically identical to PIRANO di MANDRALISCA's *Helix aradasi* and POLLONERA's *H. turbinata* (Pl. 2, figs. L-M), recently collected near the Messina Lighthouse, fully confirm our recent hypothesis.

The single species cited by POLLONERA as *H. aradasi*, *H. aradasi* var. *secessa*, *H. turbinata* and, as we have stressed elsewhere (MANGANELLI & GIUSTI, 1988), also many Sicilian populations corresponding to the large-sized *Cernuella* usually defined as *Cernuella* (s. str.) *virgata* (DA COSTA), seem to agree with the very brief description of DE CRISTOFORI & JAN for their *H. turbinata*.

Although this name cannot be used because of its primary homonymy with other species, the problem of redefining the species still exists.

The Collection of DE CRISTOFORI & JAN has been lost, no other typical materials have been traced in the most famous still existing collections (DI MARIA di MONTEROSATO, PAULUCCI, POLLONERA, DE BETTA, etc.) nor are they known to exist in the collections of the Naturhistorisches Museum Wien or the Natur Museum Senckenberg (see HAUSDORF, 1988).

Two solutions are thus possible. *H. turbinata* DE CRISTOFORI & JAN could be synonymized with *H. aradasi* PIRAJNO di MANDRALISCA, or with *Cernuella* (s. str.) *virgata* (DA COSTA)⁽⁷⁾.

As it is impossible to make an objective choice between these solutions, we think that there is less risk for the stability of the nomenclature if we apply to the International Commission on Zoological Nomenclature to place *H. turbinata* DE CRISTOFORI & JAN in the Official Index of Rejected and Invalid Specific Names in Zoology.

(6) The shell illustrated in GIANNUZZI SAVELLI *et al.*, 1986, figs. 8-10) is not that of the lectotypus (576B) but that of one of the paralectotypi (575C).

(7) We recall that CAFICI (1883) gave the name *Helix variabilis* var. *turbinata* CAFICI, to globose-conical specimens of *Cernuella virgata* collected at Calatafimi.

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EXPLANATIONS OF THE PLATES

Plate 1. - *Xeromunda* cf. *durieui* (L. PFEIFFER) from La Praia (Taranto, Italy) (A-D), and Al Albyar (About 50 km ENE of Benghazi, Libya - RMNH) (E-G). *Xeromunda candiota* (MOUSSON) from Canù, (Crete I. - WESTERLUND Coll. nr. 864, GNM) (H-K) and Serifos I. (Cyclades Is.) (L).

Plate 2. - A-B: two topotypical shells of *Helix durieui* (L. PFEIFFER) from El Kala (Algeria; POLLONERA Coll. MRSNT). C-F, K: *Helix turbinata* Auct. from «Sicilien» (NHW) (C,E-F), from Monte Catalfamo near Palermo (PAULUCCI Coll., MZUF) (D), and from Lighthouse of Messina (POLLONERA Coll., MRSNT' (K). G-H: lectotypus (H) and one of the paralectotypi (G) of *Helix aradasi*, Lighthouse of Messina (PIRAJNO di MANDRALISCA Coll., FCMC, nr. 576B, 576A respectively). L-M: *Cernuella* (s.str.) cfr. *cisalpina* (ROSSMÄSSLER) from Lighthouse of Messina anatomically studied.

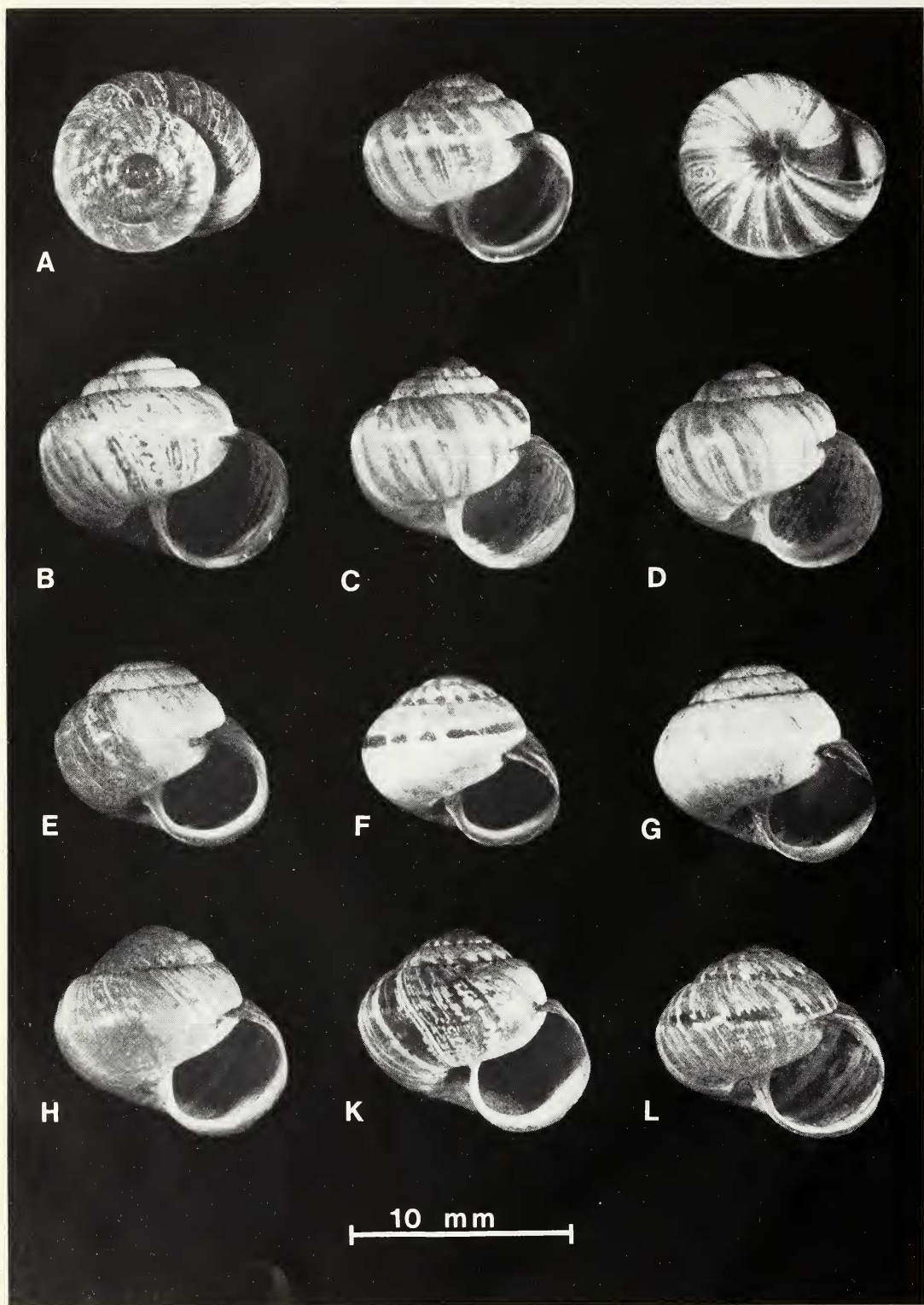
Plate 3. - *Xeromunda* cf. *durieui* (L. PFEIFFER). The radula of a specimen from La Praia (Taranto, Italy) A-D and Al Albyar (about 50 km ENE of Benghazi, Libya) E-H. A,E: central tooth (c). B-C, F-G: the lateral teeth. D,H: the extreme marginal teeth. (A-H x 750).

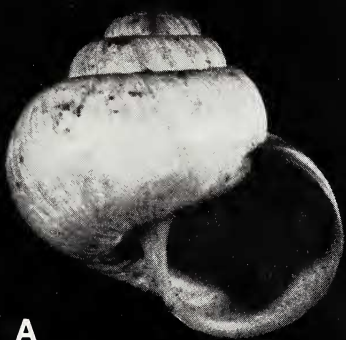
Plate 4. - *Xeromunda candiota* (MOUSSON). The radula and the jaw (H) of a specimen from Nomos Rethomnis (Crete I.) A-D and the radula of a specimen from Monemvasia (Peloponnese Peninsula, Greece) E-G. A,E: central tooth (c). B-C,F: the lateral teeth. D,G: the extreme marginal teeth. (A-G x 750; H x 65).

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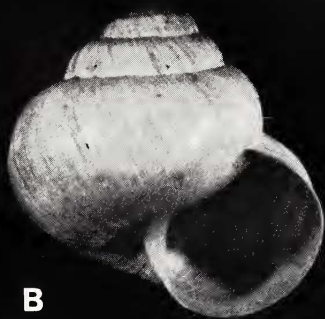
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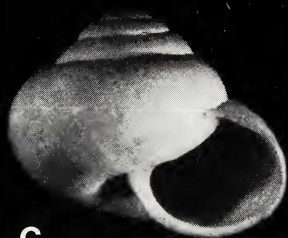




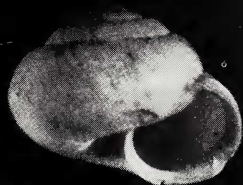
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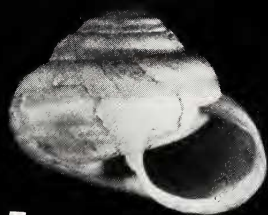
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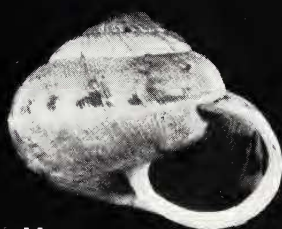
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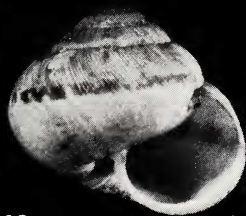
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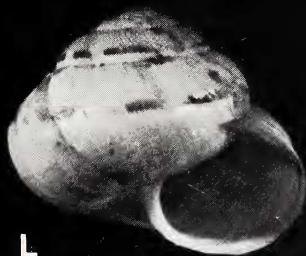
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H



K



L



M

10 mm

